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Original Article

Predictors for Early Physical Recovery for General and Orthopedic Patients after Major Surgery: Structural Equational Model Analyses

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ABSTRACT

Background: Attention to factors that may affect patients' ability to experience enhanced recovery after surgery is essential in planning for postoperative care.
Aims: To create models of predefined pre,- peri-, and postoperative variables in order to analyze their impact on patients' physical recovery on postoperative days 1 and 2 after major orthopedic and general surgery.
Design: An exploratory design with repeated measures was used, including 479 patients who had undergone orthopedic (289) or general surgery (190) at three hospitals.
Methods: Pain, nausea, and level of physical ability were measured preoperatively and on postoperative days 1 and 2 by using the Numerical Rating Scale and items from the Postoperative Recovery Profile. Structural equation modeling was used to explore the impact of the predefined variables on patients' physical recovery.
Results: The orthopedic group contained significantly more women and significantly more patients with pain and opioid use. Although the models showed good fit, "traditional" preoperative (pain, nausea, physical abilities, chronic pain, opioid use) and perioperative variables (anesthesia, length of surgery) constituted few (orthopedic) or no (general surgery) predictive properties for physical recovery. Postoperative average pain intensity, average nausea intensity, and physical ability explained physical recovery on day 1, and physical recovery on day 1 predicted physical recovery on day 2.
Conclusions: "Traditional" predictors had little effect on patients' postoperative physical recovery, while associations with common postoperative symptoms were shown. Further research is needed to explore additional variables affecting early physical recovery and to understand how soon patients are physically ready to return home.

Fast-track recovery programs, defined as a multimodal approach to enhance postoperative recovery, are used in many disciplines in which major surgery is performed (Grosso et al., 2019; Spanjersberg, Reurings, Keus, & van Laarhoven, 2011). Postoperative recovery is defined as "a return to baseline or better" by Royse et al. (2010) and is a complex process affected by a variety of factors (Stomberg, Saxborn, Gambreus, Brattwall, & Jakobsson, 2015). Attention to factors that may affect patients' ability to recover quickly is essential in planning postoperative care. Up until now, a number of studies have found evidence that variables such as greater age, low self-efficacy, high body mass index, high burden of comorbidities, open surgery (i.e. with incision), and postoperative complications affect recovery negatively (Chand et al., 2016; Hayashi et al., 2018; Kobayashi et al., 2018; Robbins, Rastogi, & McLaughlin, 2014). Furthermore, chronic pain (Erlenwein et al., 2016), opioid use (Li, Stocchi, Cherla, Liu, & Remzi, 2016), and limited preoperative physical ability are other factors found to influence the recovery process (Gillis et al., 2018). Even if patients have some of the aforementioned risks for

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